CLAIMS

1. A method of performing static timing analysis on a design, the method comprising:

performing multiple static timing analysis runs with the design, each run using a predetermined set of parameters;

saving results from the multiple static timing analysis runs; and

merging the results.

2. The method of Claim 1, wherein the multiple static timing analysis runs are independent.

3. The method of Claim 1, wherein the multiple static timing analysis runs share information.

4. The method of Claim 1, wherein the multiple static timing analysis runs are performed in parallel.

5. The method of Claim 1, wherein the multiple static timing analysis runs are performed in series.

6. The method of Claim 1, wherein saving results includes forming a database that can be queried at different levels of detail.

7. The method of Claim 6, wherein saving results includes restoring the database and making additional queries.

8. The method of Claim 7, wherein the additional queries can be made from one or more runs.

9. The method of Claim 8, wherein each query adds additional results to the saved results of each run.

10. The method of Claim 1, wherein the predetermined set of parameters includes a mode and a corner.

11. The method of Claim 10, wherein the predetermined set of parameters includes a plurality of modes and corners, wherein the multiple static timing analysis runs share information, and wherein the plurality of modes and corners are automatically analyzed to determine shared information between parallel runs.

12. The method of Claim 1, wherein the saved results include intermediate results to support arbitrary queries.

13. The method of Claim 12, wherein the intermediate results include a predetermined set of parameters that are used in creating additional results.

14. The method of Claim 1, wherein the saved results include results of predetermined queries.

15. The method of Claim 1, wherein the saved results include at least one of cell delays, net delays, transition times, a timing graph, a parasitic network, path reports, bottleneck reports, a noise bump height, a noise bump width, a noise peak time, aggressors, victims, noise rejection curves, noise slack, current density, application attributes, user attributes, cells, nets, an analysis coverage, profiling of endpoints, profiling of paths, modes, case analysis propagation, design corner description, slack, design cost, constraints, annotations, combinational loops, clock re-convergence points,

arrival times, required times, a timing window, crosstalk delays, and operating conditions.

16. The method of Claim 1, further including reporting the merged results, wherein the reported results include at least one of cell delays, net delays, transition times, timing graph, parasitic network, path reports, bottleneck reports, a noise bump height, a noise bump width, a noise peak time, aggressors, victims, noise rejection curves, noise slack, current density, application attributes, user attributes, cells, nets, analysis coverage, profiling of endpoints, profiling of paths, modes, case analysis propagation, design corner description, slack, design cost, constraints, annotations, combinational loops, clock re-convergence points, arrival times, required times, a timing window, crosstalk delays, and operating conditions.

17. The method of Claim 10, wherein performing the multiple static timing analysis runs allows multiple modes and corners to be analyzed simultaneously.

18. The method of Claim 17, further including modifying a predetermined set of parameters after completing an initial multi-mode/multi-corner analysis, and performing an analysis to provide a what-if capability, thereby driving design optimization.

19. The method of Claim 10, wherein desired information regarding a predetermined set of modes/corners can be merged before other information.

20. A report generated by static timing analysis, the report comprising:

a set of automatically merged results generated by a plurality of static timing analysis runs.

21. The report of Claim 20, wherein the results from each run are stored in a database.

22. The report of Claim 21, wherein the database can be queried at different levels of detail to generate the report.

23. The report of Claim 20, wherein the set of automatically merged results is user-specified.

24. The report of Claim 20, wherein the set of automatically merged results is determined in advance of each run.

25. An electromagnetic waveform, the electromagnetic waveform comprising a computer program for generating merged results from multiple static timing analysis runs, the computer program further comprising:

a first set of instructions for performing the multiple static timing analysis runs with a design, each run using a predetermined set of parameters;

a second set of instructions for saving results from the multiple static timing analysis runs; and

a third set of instructions for automatically merging the results.

26. The electromagnetic waveform of Claim 25, wherein the computer program further comprises a fourth set of instructions for performing the multiple static timing analysis run independently.

27. The electromagnetic waveform of Claim 25, wherein the computer program further comprises a fourth set of instructions for sharing information between the multiple static timing analysis runs.

28. The electromagnetic waveform of Claim 25, wherein the computer program further comprises a fourth set of instructions for performing the multiple static timing analysis runs in parallel.

29. The electromagnetic waveform of Claim 25, wherein the computer program further comprises a fourth set of instructions for performing the multiple static timing analysis runs in series.

30. The electromagnetic waveform of Claim 25, wherein the second set of instructions for saving results includes instructions for forming a database that can be queried at different levels of detail.

31. The electromagnetic waveform of Claim 25, wherein the predetermined set of parameters includes a mode and a corner.

32. The electromagnetic waveform of Claim 31, wherein the first set of instructions for performing the multiple static timing analysis runs includes instructions that allow multiple modes and corners to be analyzed simultaneously.

33. The electromagnetic waveform of Claim 31, wherein the computer program further comprises a fourth set of instructions

for merging desired information regarding a predetermined set of modes/corners before merging other information.

34. A method of performing static timing analysis on a design, the method comprising:

performing at least one static timing analysis run with the design, each run using a predetermined set of parameters;

saving results from each static timing analysis run to external storage;

reading at least one set of saved results; and

reporting the saved results.

35. The method of Claim 34, wherein saving results includes forming a database that can be queried at different levels of detail.

36. The method of Claim 35, wherein saving results further includes restoring the database and making additional queries.

37. The method of Claim 36, wherein the additional queries can be made from one or more runs.

38. The method of Claim 37, wherein each query adds additional results to the saved results of each run.

39. The method of Claim 34, wherein the saved results include intermediate results to support arbitrary queries.

40. The method of Claim 39, wherein the intermediate results include a predetermined set of parameters that are used in creating additional results.

41. The method of Claim 34, wherein the saved results include results of predetermined queries.

42. The method of Claim 34, wherein the saved results include at least one of cell delays, net delays, transition times, a timing graph, a parasitic network, path reports, bottleneck reports, a noise bump height, a noise bump width, a noise peak time, aggressors, victims, noise rejection curves, noise slack, current density, application attributes, user attributes, cells, nets, an analysis coverage, profiling of endpoints, profiling of paths, modes, case analysis propagation, design corner description, slack, design cost, constraints, annotations, combinational loops, clock re-convergence points, arrival times, required times, a timing window, crosstalk delays, and operating conditions.

43. The method of Claim 34, further including reporting the merged results, wherein the reported results include at least one of cell delays, net delays, transition times, timing graph, parasitic network, path reports, bottleneck reports, a noise bump height, a noise bump width, a noise peak time, aggressors, victims, noise rejection curves, noise slack, current density, application attributes, user attributes, cells, nets, analysis coverage, profiling of endpoints, profiling of paths, modes, case analysis propagation, design corner description, slack, design cost, constraints, annotations, combinational loops, clock re-convergence points, arrival times, required times, a timing window, crosstalk delays, and operating conditions.

44. A method of designing digital circuits, the method comprising:

performing a plurality of static timing analysis for different operation modes, manufacturing process corners, on operating conditions, or ambient environment conditions;

determining which scenarios should be simultaneously optimized; and

optimizing selected scenarios simultaneously in logic synthesis, placement, and routing.